Master's Thesis

Predicting Alcoholism Treatment Outcome

by

Robert W. Smith ©

First Reader

Dr. Melnyk

Second Reader

Dr. McLeod

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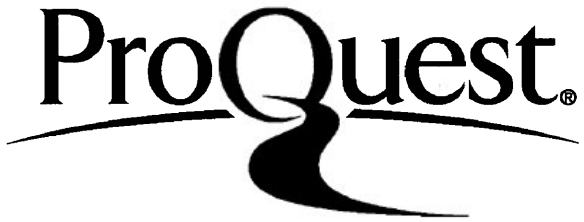

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Table of Contents

Abstract

The detrimental effects of alcoholism on society have stimulated the growth of addiction treatment centers. These programs are characterized by low completion rates. This fact has promoted a great deal of research aimed toward predicting treatment completion. If those "at risk" for dropping out of programs can be identified, they can be singled out for special consideration which could result in their success with treatment. Alternatively, if it can be determined that clients with certain characteristics have a high probability of completing treatment at specific centers, then patient characteristics can be "matched" with the program shown to offer such people the best opportunity for treatment completion. The majority of studies in this area have used MMPI scales and/or combinations of demographic variables for prediction. In general, these studies have not been very successful or have failed to replicate. Some reasons for this are small sample sizes, a limited number of variables used in prediction, and lack of cross validation. The present research addresses these problems by using large numbers of subjects and predictor variables. Cross validation was performed on an independent sample. Phase One subjects were drawn from archival records; a sample of three hundred and seventy subjects was obtained; two hundred were treatment completers and one hundred seventy non completers. Variables included in the analysis were; age, sex, race, education,

marital status, number of dependents, employment status, previous treatments, weeks sober prior to treatment, place of residence, prescription medication, referring agent, self reported reasons for referral, and the three validity and ten standard clinical scales of the MMPI. Through discriminant analysis, an overall successful classification rate of 65.4% was obtained. Treatment completers were classified correctly 74.0% and non completers 55.3%. The cross validation sample was obtained and variables collected in the same manner as in phase one. Data from one hundred treatment completers and eighty non completers was collected. The discriminant function from phase one derived an overall successful classification rate of 56.1%. Treatment completers were classified correctly 69.0% and non completers 40.0%. Results highlight a dramatic failure to predict treatment dropouts. However, treatment completers could be predicted. The relevance of this finding for treatment matching was discussed. It was concluded that, due to the heterogeneity of alcoholic samples, personality measures such as the MMPI should only be used to describe population characteristics at specific treatment centers; generalization should not be expected. It was hypothesized that, by looking for specific predictors at each treatment center instead of searching for global predictors, treatment matching is feasible, and may be very helpful in reducing dropout rates.

Within the mental health professions, one of the most problematic concerns is that of treatment drop-outs. In even a cursory examination of the literature, an appreciation of the extent of this phenomenon is readily obtained. Baekeland and Lundwall (1975) performed an exacting review of the literature. Between 32-79% of psychiatric patients sign out against medical advice (AMA); 20-57% of out-patients fail to return after the first visit; and of those who return, 31-56% attend fewer than four sessions (Baekeland & Lundwall 1975). Of course high attrition rates are not confined to psychiatric populations. The majority of mental health patients terminate treatment early, and those facilities offering out-patient services report that over 40% of their clients fail to appear for more than two sessions (Pekarik 1985).

Voluntary termination against medical advice (AMA) is a major cause for concern. Such persons have the poorest outcomes documented in the literature (Pekarik 1985). Group therapy AMA's interrupt and often hinder treatment and can influence others to drop-out (Altman, Brown, & Sletter 1972).

In addition to concerns for patient welfare, the high proportion of drop-outs present a great obstacle to the effective delivery of mental health services creating fiscal,

administrative, and personnel problems (Pekarik 1985, Slader & Mozdzierz 1985). All things being equal, if only 25% of a therapist's clients are AMA's, a low figure according to the literature, then one quarter of that therapist's time is virtually wasted. As well as being a drain on limited resources, this situation has been identified as a factor in therapist burn out (Mallash 1978).

In the area of alcoholism treatment, drop-outs have been the subject of intensive investigation (Jacobs 1980). In general, alcoholism treatment programs are characterized by high rates of early drop-out and low completion (Craig 1984). The attrition rate for out-patient services ranges from 52-75% (Baekeland & Lundwall 1975), while the average for in-patient centers is 28% (Slader & Mozdzierz 1985). The comparatively low non-completion rate at in-patient centers is assumed to be the result of shorter, more intense, and supportive programs (Baekeland & Lundwall 1975).

As in other treatment areas, patients who do not complete are more likely to be re-admitted (Bean & Krasievich 1975), and have worse outcomes (Jacobs 1980). There is a strong positive relationship between length of stay in treatment and long term benefit (Jacobs 1980, Van Stone & Gilbert 1972). Premature termination can be equated with loss of investment in terms of staff/hospital time, money, and other resources; and represents an inability to provide treatment for those probably most in need (Slader & Mozdzierz 1985).

As all mental health treatments suffer from high

attrition rates, it is not this aspect alone which has caused alcoholism treatment to become so intensely investigated. Rather, alcoholism's near epidemic prevalence, and its massive impact on society render successful treatment methods imperative.

In 1978, there were an estimated 635,000 alcoholics in Canada, more than double that estimated for 1965 (Statistics Canada 1985). A strong correlation exists between alcoholism and violent death (Haberman & Natarajan 1986). This disorder has been linked as a factor in 10.9% of all deaths, 1/3 of child abuse cases, and 30-50% of violent crimes (Health and Welfare Canada 1981). Individuals whose parents were active alcoholics during their childhood suffer three times the number of serious mental disorders found in the normal population (Werner 1986).

The Canadian Government has recently responded to the situation by increasing funding for treatment. In two years, the number of residential special care facilities increased from 149 in 1980 to 243 in 1982 resulting in an increment of 94 new centers (Statistics Canada 1985). Unless more effective treatment procedures can be developed, this massive increase in expenditures will also result in more wasted resources and a larger population of ineffectively treated patients.

The concept of treatment matching has been forwarded as a possible solution. Simply expressed, treatment matching involves placing patients with certain characteristics into facilities whose programs have been shown effective for individuals with those characteristics. Theoretically the

result would be a maximally effective utilization of resources. Before this situation can be realized, one must be able to accurately determine which patients have the best possibility of benefiting from a particular treatment regimen. In other words, the ability to differentiate between drop-outs and treatment completers must be developed as an initial stage in the formation of a treatment matching process.

Accurate assessment of personality and demographic characteristics is necessary in order to discover predictor variables. The Minnesota Multiphasic Personality Inventory (MMPI) is the most widely used personality measure; as of 1975, over 6,000 journal articles on the MMPI had been published (Greene 1980). Designed for use with subjects age 16 or over, the test was developed to assess major personality characteristics (Hathaway & McKinnley 1940). The standard form consists of ten clinical and three validity scales. One hundred sixty-seven items not used in the original scales were retained under the assumption that they might be tapping other personality dimensions (Appfeldorf 1978). From the MMPI items an incredible number of special scales have been developed. Dahlstrom, Welsh, and Dahlstrom (1975) list 455 such indices, which resulted in the utilization of previously redundant items.

The MMPI has been utilized extensively to study alcoholics. Three scales; the Al scale (Hampton 1953); the Ah scale (Button 1956); and the AMac (revised MacAndrews) scale (MacAndrews 1965) were developed for diagnosis. While these

instruments have varying degrees of success, the AMac is the most consistently accurate (Miller 1976).

From the literature, a wealth of information can be obtained describing characteristic alcoholic responses. Most studies using the MMPI with alcoholics focus on detection and differential diagnosis (Hollon & Mandell 1979). Elevations of scales 2 and/or 4 are consistently found higher in alcoholic profiles compared to normal samples (Appfeldorf 1974, Miller 1976, Overall 1973, Owen & Hatsukami 1979). The same result is found among Native American alcoholics (Kline, Rozynko, & Roberts 1973), Blacks (Craig 1984), and among drug addicts (Overall 1973, Pataland 1980). However, scales 2 and 4 were not different in Italian or Swiss samples (Butcher & Pancheri 1976) suggesting that these scales may only be valid indicators of the possibility of alcoholism in North American populations. It is likely that drinking behaviors are more culturally determined than serious pathology such as schizophrenia (Butcher & Pancheri 1976).

Even with the popular cookbook approach, scales 2 and 4 appear to be critical in delimiting alcoholic profiles. Hodo and Fowler (1976) examined the 2 point codes for high point pairs found in a large sample of male alcoholics. While the sample mean profile code type was 2-4/4-2, it accounted for only 21% of the 2 point codes present. The 20 most commonly appearing 2 point codes all contained at least one elevation on scale 2 and/or 4, and in total, accounted for 79% of the sample.

These results highlight the fact that there are many MMPI scale score similarities between alcoholic profiles across samples. In view of such consistent findings, a clinician would be wise to investigate the possibility of substance abuse when faced with a profile having elevations on scales 2 or 4. But the vast differences in personality descriptors between various code types containing a 2 or 4 preclude their being described uniformly. Such evidence has led researchers to reject the claim of a homogeneous alcoholic personality (Hollon & Mandell 1979, Hodo & Fowler 1976, Miller 1976, Pfost, Kunce, & Stevens 1984).

Not only are scales 2 and/or 4 generally associated with the diagnosis of alcoholism using the MMPI, higher elevations on these scales tend also to be associated with treatment dropout (Craig 1984, Huber & Danahy 1975, Miller 1976, Pfost, Kunce, and Stevens 1984). Scales L (Krasnoff 1976), and K (Mozdzierz, Macchitelli, Conway, & Kraus 1973) have also been shown to be significantly inflated among drop-out profiles. Patients who are most likely to complete alcoholism treatment tend to be female (Covey 1982), older (Craig 1984, Jacobs 1980), married (Jacobs 1980), and have no previous history of treatment attempts (Covey 1982),

Thrower (1981) studied the utility of MMPI specialty scales to predict treatment completion. Measures were obtained on the Conscious Anxiety, Conscious Repression, Dependency, Dominance, Control, Admission, and Denial scales. No scale accounted for much of the variance between groups (Thrower

1981). Earlier research with specialty scales obtained similar results (Krasnoff 1977 - Admission, Control, Denial, & Dependency, Krasnoff 1976 - Repression & Sensitivity).

Two researchers have recently developed a scale with which to predict AMA discharges. Slader and Mozdzierz (1985) compared the profiles of 70 completers and 23 non-completers. Through item analysis 21 items were selected for inclusion in their scale. The items selected and their keyed direction were 4(T), 9(F), 33(T), 119(F), 152(F), 153(F), 174(F), 184(T), 186(T), 211(T), 234(F), 243(F), 254(F), 287(F), 330(F), 331(T), 391(T), 414(T), 443(T), 461(T), and 557(T). Only 29% of these items or 6 of 21 were from scales 2 or 4 (items 9, 33, 152, 153, 287, and 331). A reported hit-rate accuracy of 91.36% was obtained. Cross-validation was performed with a sample chosen from an alternate treatment facility which included 64 completers and 24 drop-outs. The hit-rate for this sample was 75.34%. With such encouraging results, the authors concluded that the Against Medical Advise (AMA) scale's classificatory accuracy demonstrated its future utility in prediction (Slader & Mozdzierz 1985).

The most perplexing problem faced by researchers in this area is the failure to discover predictors that replicate with a degree of consistency. Mozdzierz, Macchitelli, Conway, & Krause (1973) found the K scale effective in differentiating between treatment outcomes, while others did not (Craig 1984, Huber & Danahy 1975, Jacobs 1980, Krasnoff 1976, Miller 1976, Pfost, Kunce, & Stevens 1984). Higher elevations on the L scale were

found to denote drop-outs by Krasnoff (1976), but not by Craig (1984), Huber and Danahy (1975), Miller (1976), Mozdzierz, Macchitelli, Conway, and Krause (1973), or Pfost, Kunce, and Stevens (1984). These examples clearly illustrate the problem.

Reasons for lack of replication among studies can be discovered by the examination of research designs. Many did not include sufficient demographic data (see Covey 1982, Huber & Danahy 1975, Krasnoff 1976). Krasnoff (1976) studied the MMPI profiles of 62 alcoholics. All subjects were male and no other demographic characteristics were reported. Failure to present such data prevents accurate comparisons. It is impossible to determine whether or not these samples are comparable to those in other studies.

For the most part, research in determining the characteristics of treatment non completers has emphasized differences between dropouts and treatment completers. Significant discriminators are found between MMPI and demographic data of the two groups. The results are then used to illuminate the dissimilarities with few attempts at actual prediction. Therefore, these indices were compared only against the sample used to create them with no attempt at cross-validation (Craig 1984). Even when cross-validation occurs, the results may have limited value. Slader and Mozdzierz (1985), as described earlier, developed an AMA scale with cross-validation. Over-all hit rates of 91.39% for the standardization sample and 75.34 for the cross-validation sample were reported to be significantly better than expected. The

purpose of the scale is to identify persons who may or may not benefit from alcoholism treatment in general. A wrong decision stating a person may not benefit would have a larger impact than the reverse. In light of this, it would be desirable to be most accurate with negative decisions. The hit rate for accurate prediction of drop-outs in the cross-validation sample was 52%. The above places the utility of the AMA scale in doubt.

Discrepancies between research results and poor methodology have contributed to the current difficulties in predicting treatment completion at alcoholism facilities. As yet no reliable method is available. The present study was conducted to determine whether or not prediction was feasible with the MMPI. Numerous demographic variables were obtained to allow for accurate sample descriptions and to test their effect on prediction. Large samples were utilized and cross-validation was performed.

Procedure

Phase One

Subjects

Of the three hundred seventy subjects, two hundred had completed treatment and one hundred seventy had dropped out. See table 1 for sample characteristics.

Of the two hundred treatment completers, the mean age was 33.1 years; 50% were male and 50% female; 35.5% were native Canadian and 64.5% non native; mean education 10.3 years; 27% married or living common law, 27.5% separated or divorced, and 45.5% were single; mean number of dependents 1.1; 36.5% employed and 63.5% unemployed; mean number of weeks sober prior to treatment 1.7; mean number of previous treatment attempts 1.0; 36.5% were residents of Thunder Bay, 55% from the local area, and 8.5% from out of province; 16% were on mood altering prescription medication and 84% were not; self reported reasons for being admitted were court order or work mandatory 3.5%; desiring help with general life problems 17%; and alcoholism treatment 79.5%, referring agent was family or health worker 16.5%, work place, Family and Children's Services, or Probation and Parole 19%; and self referred 64.5%

Of the one hundred seventy non completers the mean age was 31.4 years; 58.8% were male and 41.2% female; 35.3% native

Canadian and 64.7% non native; mean education 9.6 years; 32.4% married or living common law, 16.5% separated or divorced, and 51.2% single; mean number of dependents 1.0; 24.7% employed and 75.3% unemployed; mean number of weeks sober prior to treatment 1.2; mean number of previous treatment attempts 0.9; 47.1% were residents of Thunder Bay, 45.3% from the local area, and 7.6% from out of province; 11.8% on mood altering prescription medication and 88.2% were not; self reported reasons for being admitted were court order or work mandatory 7.6%, desiring help with general life problems 20%, and alcoholism treatment 72.5%; referring agent was family or health worker 15.9%, work place, Family and Children's Services, or Probation and Parole 31.8%, and self referred 52.3%.

Method

Subject data was obtained from archival records held at Smith Drug and Alcohol Dependency Clinic in Thunder Bay. To be admitted for treatment, the patient must be diagnosed chemically dependent and be free of non-prescription drugs and alcohol for forty eight hours. Treatment includes individual counseling, group therapy, lectures, patient assignments, and an introduction to Alcoholics Anonymous with compulsory meetings attended during treatment. Beginning with the most recent cases, patient files were used for data collection unless (a) their MMPI was declared invalid by a psychometrist and was therefore re-administered, (b) no MMPI was available due to brevity of stay in treatment, (c) the patient had a previous history of treatment at Smith Clinic, or (d) the client was

admitted for treatment of an addiction to a drug other than alcohol. Rejection criteria (c) was included to prevent repeated measures of subjects. All MMPI's were administered to subjects on the day of their admission to the treatment program.

Data for demographic variables were gathered in the proceeding manner. Age, weeks sober, number of dependents, education, and number of previous treatments were recorded as continuous variables. Sex, race, employment status, and medication were treated as dichotomous category variables. Non dichotomous category variables were coded as follows; marital status 2 if married or common law, 1 if separated or divorced, and 0 if single; place of residence 2 if from southern Ontario or out of province, 1 if from the local area, and 2 if from Thunderbay; self reported reason for treatment 2 if court or work mandatory, 1 if general life problems, and 0 if alcoholism; referring agent 2 if work mandatory, Family and Children's Services, or court order, 1 if family member or doctor, 0 if self, AA member, or alcoholism worker.

In addition to the above mentioned variables, the subject's raw scores on MMPI scales L, F, K, 1, 2, 3, 4, 5, 6, 7, 8, 9, and 0, were obtained. Scales 1, 4, 7, 8, and 9 were recorded with and without the K correction. See Table 1a. for the means and standard deviations of the above scales in both phases.

Results

Anovas were performed on all variables. Those found to differ significantly between treatment outcomes were the F scale, $f(1,368)=17.16$, $p<.001$, scale 8 $f(1,368)=5.92$, $p=.015$, scale 6, $f(1,368)=5.02$, $p=.026$, employment status, $f(1,368)=6.03$, $p=.015$, referring agent, $f(1,368)=8.03$, $p=.005$, weeks sober prior to treatment, $f(1,368)=5.57$, $p=.010$, and education, $f(1,368)=9.30$, $p=.003$. As the K scale was not found to be significantly different between groups, the K correction was not added to scales used in the discriminant analysis.

A stepwise discriminant analysis was performed to test group differences. Group samples were weighted equally. The thirty variables entered into the equation were age, sex, race, education, marital status, number of dependents, employment status, number of weeks sober prior to treatment, previous treatment attempts, place of residence, self reported referral reason, referring agent, presence or absence of mood altering prescription drugs, and raw scores from scales L, F, K, 1, 2, 3, 4, 5, 6, 7, 8, 9, and 0 without the K correction. Bartlett's Box M produced an approximate F of 1.29, $p=.049$ with 12 degrees of freedom. As this measure of group covariance equality is sensitive to large sample sizes, it was decided that this probability was not low enough to assume inequality of group covariances and the function was accepted.

The discriminant function was significant chi-square$(12)=51.81$, $p<.001$. Wilk's Lambda however was rather

large at .867. A significant (chi-square(1)=34.83, p<.05) overall successful classification rate of 65.4% was obtained. Completers were classified correct 74% which was significant (chi-square(1)=46.08, p<,05), whereas non completers were only classified correctly 55.5% of the time which was a non significant result (chi-square(1)=1.91, p>.05). Variables included in the function were scales F, 4, and 6, weeks sober, referring agent, place of residence, employment status, education, marital status, race, and sex.

Phase Two (Cross Validation)

Procedure

Subjects

Of the one hundred and eighty subjects, one hundred had completed treatment and eighty had dropped out. See Table 1 for comparison a of sample demographics between the two phases.

Of the one hundred treatment completers, the mean age was 32.1 years, 50% were male and 50% female; 31% native Canadian and 69% non native; mean education 10.8 years; 39% married or living common law, 20% separated or divorced, and 41% single; mean number of dependents 1.3; 40% employed and 60% unemployed; mean number of weeks sober prior to treatment 2.1; mean number of previous treatment attempts 0.7; 44% were residents of Thunder Bay, 50% from the local area, and 6% from out of province; 13% on mood altering prescription medication and 87% were not; self reported reasons for being admitted were court order or work mandatory 9%, desiring help with general problems 14%, and alcoholism treatment 77%; referring agent was family or health worker 9%, work place, Family and Children's Services, or Probation and Parole 27%, and self referred 64%.

Of the eighty non completers, the mean age was 30.8 years; 62.5% male and 37.5% female; 42.4% native Canadian and 57.6% non native; mean education 9.6 years; 33% married or

living common law, 20% separated or divorced, and 47% single. mean number of dependents 1.0; 36% employed and 64% unemployed; mean number of weeks sober prior to treatment 1.2; mean number of previous treatment attempts 1.0; 33.8% residents of Thunder Bay, 62.5% from the local area, and 3.8% from out of province; 9.7% were on mood altering prescription medication and 90.3% were not; self reported reasons for being admitted were court order or work mandatory 4.7%, desiring help with general life problems 29%, and alcoholism treatment 66.3%; referring agent was family or health worker 25%, work place, Family and Children's Services, Probation and Parole 26.2%; and self referred 48.8%.

Method

Subjects and data were obtained in the same manner as in Phase one.

Results

Analysis of variance was performed on all variables. Those found to differ significantly between treatment outcomes were scale 5, $f(1,178)=11.32$, $p=.001$, number of weeks sober prior to treatment, $f(1,178)=10.43$, $p=.001$, and education, $f(1,178)=11.74$, $p=.001$. See Table 2 for a comparison of anova results between phases one and two. The only variable found significant in both phases was weeks sober prior to treatment and education.

The classification accuracy of the discriminant function calculated in phase one was cross validated with the subjects from phase two. The overall successful classification rate of 56.11% was not significant (chi-square(1)=2.68, $p>.05$). Treatment completers were correctly classified 67% which was significant (chi-square(1)=14.44, $p<.05$), while non completers were classified correctly 40% of the time; a non significant result (chi-square(1)=3.2, $p>.05$). See Table 3 for comparison of both phases classification accuracy.

Discussion

From the results of this study, it can be concluded that predicting treatment dropouts with the variables utilized was not possible. In phase one, dropouts were predicted correctly 55% of the time, and only 40% correct in the cross validation sample. Since the completer and non completer sample sizes were kept relatively equal, such results are no better than one would expect to obtain by tossing a coin. In fact, using the discriminant function, the prediction on phase two was much worse with only 40% accuracy. On the other hand, treatment completion was predicted with a high probability of accuracy; 74% in phase one and 69% in the cross validation sample. Similar results were obtained by Craig (1984) who found that treatment dropout could not be significantly predicted whereas predicting completion was successful. The shrinkage experienced by the present study during cross validation, 15% with dropouts and only 5% with completers, also suggests greater accuracy and generalization of results in predicting completion of alcoholism treatment.

Variables found to significantly differ between completers and dropouts in phase one were weeks sober, referring agent, employment status, education, and MMPI scales F and 8 (without the K correction). On the surface, these results appear to be congruent with previous research. For example, Jacobs (1980) found education and scale F to be significantly

different between groups. However, upon closer examination, similarities in the literature are scarce. Thus, variables found significantly different by other researchers that were included but not found significant in the present study are, the L scale (Krasnoff 1976), K scale (Mozdzierz, Macchitelli, Conway, & Kraus 1973), scale 2 (Craig 1984), scale 4 (Huber & Danahy 1975, Pfost, Kunce, & Stevems 1984), age (Jacobs 1980), sex (Covey 1982), and previous treatments (Covey 1982). Within the present study, results did not have high agreement. In the cross validation sample, only weeks sober, education, and scale 5 were significantly different between outcomes. Of these, only weeks sober and education were significantly different between outcomes for both phases and none of the MMPI scales consistently differed in the two phases. While there is some agreement in the literature over which variables differ between treatment outcomes, the majority of findings are at variance.

Craig (1984) performed discriminant analysis on treatment outcomes. Variables entered into the function were MMPI scales 6, 8, and 9, and age. In the present study, variables in the discriminant function were scales F, 4, and 6, weeks sober, education, employment status, race, sex, marital status, referring agent, and place of residence. The above results suggest that alcoholic samples are very heterogeneous and/or different treatment programs have differing effects on alcoholics.

Alcoholics have long been recognized as a heterogeneous population. In an in depth early literature review on

alcoholics, Bowman and Jellinek (1941) reported that in the early part of this century, there was a tendency to exaggerate the importance of heavy drinking in the etiology of psychosis. A causal relationship was seen between such behavior and the development of pathology. The authors suggested that alcoholic behavior should be viewed as symptomatic of other disorders and not the cause of them (Bowman & Jellinek 1941). The arguments for and against this position are very difficult to prove. However, even longitudinal studies following subjects from birth to the diagnosis of alcoholism could not decide the issue. If a person were to display paranoid behaviors and then heavy drinking, those who believe alcoholism a symptom of another underlying pathology could state that the paranoia was simply caused by being in a pre-alcoholic phase. The reverse situation could also be argued. While it is not the scope to this paper to support either position, such arguments emphasize that alcoholism is not expressed in any consistent, reliable manner.

Taking the argument further, the utility of personality measures in predicting the behavior of alcoholics is in grave doubt. The majority of studies on treatment outcomes use MMPI scales either in conjunction with demographic variables, or alone. As similar experiments continually find conflicting results, support for the heterogeneity of alcoholics becomes evident, and the value of such measures as they are currently being used is in question. Craig (1984) has suggested that personality tests may not be useful to predict dropouts as the decision to quit treatment may be more environmentally determined To be fair, it should be mentioned that some research

has been partially self defeating, and therefore cannot be accepted as either support for heterogeneity or as evidence of predictability. Many studies have found the K scale to be non significant in predicting outcomes, but failed to remove the K correction from scales 1, 4, 7, 8, and 9, resulting in these scales being contaminated by a non significant variable (eg. Craig 1984, Huber & Danahy 1975, Krasnoff 1976, Pfost, Kunce, & Stevens 1984).

In light of the weight of disparaging results in the area of predicting treatment outcomes, an argument could be forwarded advocating abandonment of this line of research. Overall, studies have either failed to predict or replicate (Bean & Krasievich 1975, Craig 1984, Slader & Mozdzierz 1985). But the dropout literature is plagued with problems. Small sample sizes, lack of demographic information, and failure to attempt cross validation evidence methodological flaws (Pekarik 1985). Another difficulty may be that, with the wealth of literature available being so vast, important information may be easily overlooked. Huber and Danahy (1975) reported that many alcoholics who enter treatment suffering from the effects of drinking leave once they begin to feel better. Except in the present study, the variable of time abstinent prior to treatment has been largely ignored, and yet it was found to be one of the two variables significantly different in both samples.

Additionally, dropout literature has virtually ignored the effects of different treatments, and the treatment process itself (Finney, Moos, & Chan 1981). One reason for this

oversight may be that, in the field of alcoholism treatment, failures are generally attributed to client deficits (Miller 1985). Alcoholics tend to be seen as poorly motivated, resistant, and having a poor prognosis (Nir & Culter 1978, Tamerin, Tolor, Holson, & Neuman 1974). In a survey of hospital based alcoholism treatment programs, it was found that 72% of staff blamed the client while only 11% were willing to accept partial responsibility for program failures (Moore 1971). With such attitudes being so pervasive in the field, it is easy to understand why research on treatment dropouts tend to focus entirely on patient characteristics as predictors of treatment failure.

One treatment process variable, that of counselor attitude toward the client, has been shown to have great effects on a patient's probability of completing the program. Leak and King (1977) informed alcoholism counselors that certain clients, chosen randomly, were likely to have rapid recovery. These clients were noted by counselors as being more motivated and cooperative. This client group displayed fewer dropouts and had more sober days with fewer relapses over a one year follow up period. In a review of the literature in the area of alcoholic's motivation for treatment, Miller (1985) concluded that patients are considered well motivated if they accept the therapist's views, are distressed by their situation, and comply with counselor direction. It appears that, in ignoring such variables as a counselor's attitude toward clients, we have lost an important determinant of patient behavior in treatment.

From the preceding discussion, it may be concluded that, to date, the literature on alcoholism treatment dropout has failed to find reliable predictors. Various reasons have been forwarded including the apparent futility of attempting to discover common predictive personality variables among a heterogeneous population. It would also seem that many variables which could conceivably account for large amounts of variance have been virtually ignored. However, it may be that research in this area has been wrongly focused. It is generally recognized that alcoholics are a heterogeneous population, and there exists few common descriptions of alcoholic populations in different treatment centers. Also, different treatment orientations, for example outpatient and inpatient, have differing treatment completion rates. These facts do not suggest that a single set of dropout predictors can possibly be found to allow for reliable prediction in differing centers with different client populations. The logical conclusion would be to systematically study the effects of treatment characteristics on client characteristics. Once this is accomplished, clients with X characteristics could be matched with the treatment program whose characteristics are known to have the highest probability of success with such persons.

One might argue that simply improving in the number of alcoholics who complete treatment does necessarily mean an improvement in success over time. But there is evidence of a positive relationship between program completers and long term outcome (Van Stone & Gilbert 1972). Additionally, alcoholics display a much higher level of pathology before than after

treatment (Ends & Page 1959, Hollon & Mandell 1979, Sutker, Archer, & Allain 1979). It seems that completing treatment alone does have positive benefit, and in light of the incident and effects of alcoholism, even slight increases in the percentage of completers would have large effects on many individuals.

As Allison and Hubbard (1985) have stated, the ultimate aim of treatment outcome research should be to discover the kind of treatment most effective for specific types of problems. Cronbach (1957) believes that there is no value in predicting treatment outcome unless the information obtained can be used for better choice of treatments available. Finney and Moos (1986) report widespread support for the concept of treatment matching (also called prescriptive or differential treatment), and cite the complexity of the problem as the main reason why there has been no powerful matching approach developed.

Few studies have actually attempted to match clients with treatments. However, McLellan, Woody, Luborsky, O'Brien, and Druley (1983), with a very simple approach, showed matching to be effective. Patients being assessed for treatment were judged on a 10 point scale for global severity of pathology. Six treatment centers, four inpatient and two outpatient, were studied to determine which client groups improved most in that center. A sample of patients were then matched with the appropriate program. Comparing results with a non matched control group showed a 19% better outcome in the matched group. Thus, the authors were able to increase program effectiveness

without changing the program's format or incurring increased costs.

Although these results are promising, a 19% improvement rate is still lacking in view of average treatment failure rates. In their review of methodological concerns for treatment matching, Finney and Moos (1986) concluded that in order for successful matching to occur, a great deal of research must be implemented to allow for a better understanding of the patient/treatment interaction. Issues involved are selecting effective variables from the immense array available, specifying the results matching is designed to improve, and determining the stage in the treatment process at which matching should occur. The authors believe that, due to the complexity of the problem, it is unlikely that dramatic breakthroughs will occur. However, as knowledge of the patient/treatment interaction increases, more complex approaches can be developed resulting in higher success rates.

For effective matching to be possible, a number of problems must be sorted out and specific information obtained. Accurate data on the effectiveness of programs must be established. Detailed analysis of the effects of treatment components for example, length of treatment, number of hours of group/individual therapy, and type of therapy is needed. When personality measures such as the MMPI are used, variables known to effect scores should be controlled, for example, Carey, Faulstich, and Dellatte (1985) have shown that an alcoholic's age can be predicted on the basis of MMPI scores. In spite of

past problems and future complexity, outcome research as utilized through a treatment matching process, appears to be very promising in increasing alcoholism treatment effectiveness. The ability to identify those having a high probability of success at specific centers, as was found in the present research, can be seen as initial evidence for the future efficacy of treatment matching.

Conclusions

Although this research was unable to predict treatment dropouts, those who had a high probability of success could be isolated. This result was successfully cross validated. The apparent heterogeneity of alcoholic populations, and differing effects of treatment centers seems to negate the probability of finding one set of outcome predictors for all situations. Such findings limit the usefulness of personality measures like the MMPI to describing the specific characteristics of patients that should do well at specific treatments and not as global indicators of outcome. Matching patient populations with programs is the most likely answer to the problem of dropouts. More exacting research on the patient/treatment interaction in needed.

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Table 1
Sample Demographics

	Phase 1		Phase 2	
	Completers (n=200)	Non-Completers (n=170)	Completers (n=100)	Non-Completers (n=80)
Age (Mean)	33.1	31.4	32.1	30.8
Sex: Male	50.0%	58.8%	50.0%	62.5%
Female	50.0%	41.2%	50.0%	37.5%
Race: Native Canadian	35.5%	35.3%	31.0%	42.4%
Non Native	64.5%	64.7%	69.0%	57.6%
Education (Mean)	10.3	9.6	10.8	9.6
Marital Status:				
Married/Common law	27.0%	32.4%	39.0%	33.0%
Separated/Divorced	27.5%	16.5%	20.0%	20.0%
Single	45.5%	51.2%	41.0%	47.0%
Number of Dependents (Mean)	1.1	1.0	1.3	1.0
Employment Status:				
Employed	36.5%	24.7%	40.0%	36.0%
Unemployed	63.5%	75.3%	60.0%	64.0%
Weeks Sober Prior to Treatment (Mean)	1.7	1.2	2.1	1.2
Previous Treatments (Mean)	1.0	0.9	0.7	1.0
Residence:				
Thunder Bay	36.5%	47.1%	44.0%	33.8%
Local Area	55.0%	45.3%	50.0%	62.5%
Out of Province	8.5%	7.6%	6.0%	3.8%
On Prescription Medication:				
Yes	16.0%	11.8%	13.0%	9.7%
No	84.0%	88.2%	87.0%	90.3%
Reason for Treatment: (Self Reported)				
Court, Work Mandatory	3.5%	7.6%	9.0%	4.7%
General Life Problems	17.0%	20.0%	14.0%	29.0%
Alcoholism	79.5%	72.5%	77.0%	66.4%
Referring Agent:				
Family, Health Worker	16.5%	15.9%	9.0%	25.0%
Work, C.A.S., Court	19.0%	31.8%	27.0%	26.2%
Self	64.5%	52.4%	64.0%	48.8%

Table 1A.

Means and Standard Deviations for MMPI Scales

	Phase One		Phase Two	
Scale	Mean	S.D.	Mean	S.D.
L	3.22	2.17	3.50	2.84
F	14.89	7.42	13.51	6.70
K	9.40	4.46	10.19	7.34
Hs	14.34	6.11	13.89	7.45
D	29.97	6.41	29.94	7.58
Hy	26.20	6.77	25.96	6.35
Pd	27.51	5.43	26.01	4.71
Mf	29.98	5.90	30.71	7.57
Pa	16.27	4.75	15.67	4.35
Pt	28.96	8.97	27.79	9.07
Sc	32.44	12.67	30.97	12.48
Ma	22.74	5.06	22.52	6.00
Si	37.33	8.96	36.83	9.87

* all scores are raw scores without the K correction

Table 2

F Ratio Significance Levels of Individual Variables
By Treatment Outcome

	Phase 1	Phase 2
Medication	.244	.370
Previous Treatments	.423	.196
Reason for Treatment	.102	.267
Weeks Sober	.019*	002**
Referring Agent	.005**	.265
Residence	.078	.415
Employment Status	.015*	.584
Number of Dependents	.500	.095
Education	.003**	.001**
Marital Status	.971	.391
Race	.967	.201
Sex	.090	.094
Age	.177	.359
L Scale	.953	.317
F Scale	.000**	.357
K Scale	345	.668
Scale 1	.626	.731
Scale 2	.128	.333
Scale 3	.173	.550
Scale 4	.504	.843
Scale 5	.115	.001**
Scale 6	.026	.198
Scale 7	.190	.669
Scale 8	.015*	.945
Scale 9	.085	.834
Scale 0	.840	.464

* significant at the .05 level
** significant at the .01 level

Note: K correction not added to MMPI scale scores

Table 3

Discriminant Analysis
Classification Accuracy Results

Phase 1

	Correct	Incorrect
Completers*	74.0%	26.0%
Non Completers	55.3%	44.7%
Total Sample*	65.41%	34.69%

Phase 2

	Correct	Incorrect
Completers*	69.0%	31.0%
Non Completers	40.0%	60.0%
Total Sample	56.11%	43.88%

*=significant at the .05 level